

### **REMARKS**

This paper responds to the Office Action mailed on December 12, 2006.

Claims 9, 14, 40-42, 46 and 50 are amended, no claims are canceled, and no claims are added; as a result, claims 9-14 and 40-52 are now pending in this application.

#### **§102 Rejection of the Claims**

Claims 9-14 and 40-45 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,447,757 to Cairncross, (hereinafter, "the Cairncross reference"). Applicants disagree with the Examiner's rejection based upon the Cairncross reference, and request reconsideration of this rejection based upon the following remarks.

The Examiner has cited Example 3 in the Cairncross reference for disclosing all elements of claims 9-14 and 40-45. Referring now to Example 3, the reference teaches chemically-etching a polyimide film (col. 11, lines 15-21) and applying a silver halide emulsion to the polyimide film (col. 11, lines 22-27). The polyimide film having the silver halide emulsion is placed in contact with a screen and a negative phototool having line patterns (col. 11, lines 29-36). The silver halide emulsion is exposed (col. 11, lines 38-41) and developed to produce an electrically conductive "opaque solid silver background" pattern corresponding to the screen and the phototool (col. 11, lines 62-66). The electrically-conductive pattern is then electroplated with nickel to a desired thickness (col. 12, lines 5-11). Accordingly, a structure having solid areas covered by the electroplated nickel, and penetrable open areas having the exposed polyimide film is created.

The disclosed structure is then subjected to an etching process that preferentially removes the exposed polyimide from the open area, while not removing the electroplated nickel. The etching process is give sufficient time *to remove all of the polyimide from behind the screen wires* (col. 12, lines 24-27). Applicants therefore submit that the Examiner misunderstands the Cairncross reference. Since the polyimide is removed from substantially all of the exposed portions of the screen (through which the dye material passes during screen printing), Applicants further submit that the alleged top, bottom and side portions in the Cairncross reference have an *equivalent* surface tension corresponding to the surface tension of nickel.

Referring now to the claims, claim 9 recites in pertinent part: "A semiconductor die

stencil...having a top surface, a bottom surface, and one or more side surfaces, *the bottom surface having a surface tension less than a surface tension of the top surface and less than a surface tension of the side surfaces.*". (Emphasis added). Cairncross does not disclose this. Claim 9 is therefore allowable. Claims depending from claim 9 are also allowable based upon the allowability of claim 9 and further in view of the additional limitations recited in the base claim.

Claim 10 presently recites: "A semiconductor die stencil having at least a first surface and a second surface, *the first surface having a surface tension less than a surface tension of the second surface to retard adhesive running from the second surface onto the first surface.*". (Emphasis added). Again, Cairncross does not disclose this. Instead, Cairncross discloses a mesh structure that does not include a polymer film on a contact surface, so that the surface tension on all portions of the mesh structure are equivalent. Claim 10 is therefore allowable. Claims depending from claim 10 are also allowable based upon the allowability of claim 10 and further in view of the additional limitations recited in the base claim.

Claim 14 recites in pertinent part: "A semiconductor die stencil...having at least a first surface and a second surface, *the first surface having a surface tension greater than a surface tension of the second surface to promote adhesive running onto a semiconductor die.*". (Emphasis added). As described more fully above, Cairncross does not disclose this. Claim 14 is therefore allowable. Claims depending from claim 14 are also allowable based upon the allowability of claim 14 and further in view of the additional limitations recited in the base claim.

#### §103 Rejection of the Claims

Claims 46-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,269,874 to Pryor *et al.* (hereinafter, "the Pryor reference"). Applicants disagree with the Examiner's rejection based upon the Pryor reference, and request reconsideration of this rejection based upon the following amendment and remarks.

With reference to Figure 1 of the Pryor reference, a stencil disc 20 is interposed between a spraying means 11 and a part 5. The stencil disc 20 is configured to be rotated relative to the part 5 so that different stencil apertures 26 may be moved between the part 5 and the spraying

means 11. The Pryor reference further discloses that the stencil disc 20 has a self-cleaning feature that is implemented by spinning the stencil disc 20 to a predetermined rotational speed so that excess ink is radially ejected from the stencil disc 20. The Examiner is directed to column 5, lines 15-27 for this teaching. Accordingly, Applicants submit that the stencil disc 20 *cannot be directly applied* to a substrate to be coated with the ink, since the excess ink would be substantially smeared across the surface of the substrate. Applicants therefore submit that the Examiner's proposed combination fails since *the disclosed cleaning process would render the apparatus unsuited for its intended purpose*.

Turning again to the claims, differences between the claim language and the applied reference will be specifically pointed out. Claim 46, as amended, recites in pertinent part: "A semiconductor die stencil to assist in application of a printable adhesive in a desired pattern onto a semiconductor die comprising...a coating applied to the bottom surface of the sheet to retard spreading of the printable adhesive onto the bottom surface of the sheet *when the sheet contacts the semiconductor die...*". (Emphasis added). The Pryor reference does not disclose or fairly suggest this. Instead, Pryor discloses a stencil structure that must be suspended above a semiconductor die. Claim 46 is therefore now in allowable form. Claims depending from claim 46 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claims 46-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Pryor reference in view of U.S. Patent No. 5,460,316 to Hefele (hereinafter, "the Hefele reference"). Applicants disagree with the Examiner's rejection based upon Pryor in combination with the Hefele reference, and request reconsideration of this rejection based upon the following remarks.

The Pryor reference has been discussed in detail above. The Hefele reference is cited for disclosing stainless steel for a stencil sheet material. Applicants submit that the Hefele reference fails to disclose the teachings missing from the Pryor reference, as explained in further detail above. Claims 46-49 are therefore allowable over the cited combination.

Claims 9, 14, 40, 45 and 50-52 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,803,101 to Ahn *et al.* (hereinafter, "the Ahn reference") in

view of the HefeLe reference. Applicants yet again disagree with the Examiner's rejection, and request reconsideration of this rejection based upon the following amendments and remarks.

Figures 2 and 3 in the Ahn reference disclose a mask structure 28 formed from a stencil layer 32 and a mesh layer 30 that are arranged in a mutually abutting relationship (col. 2, lines 23-25). The Ahn reference further discloses that the stencil layer 32 and the mesh layer 30 may be comprised of similar or dissimilar metallic materials that are preferentially coated to inhibit abrasive effects that occur between a paste having metal particles, and a ceramic substrate. The Examiner admits that the Ahn reference fails to disclose or suggest a "protective coating" applied to a bottom surface of the disclosed structure. Accordingly, the Examiner cites the HefeLe reference for this missing teaching. Applicants note, however, that the HefeLe reference only discloses a protective diamond coating applied to a lower surface, to further protect the stencil from abrasive effects. The applied references fail to disclose singly, or in any motivated combination a surface coating that provides a surface tension that is one order of magnitude different than a surface tension provided on other portions of the stencil.

Referring again to the claims, Claim 9, as amended, recites in pertinent part: "A semiconductor die stencil having a top surface, a bottom surface, and one or more side surfaces, the bottom surface having a surface tension *at least one order of magnitude less* than a surface tension of the top surface and *at least one order of magnitude less* than a surface tension of the side surfaces." (Emphasis added). Neither the Ahn reference nor the HefeLe reference disclose this. Claim 9 is therefore now allowable. Claims depending from claim 9 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claim 14, as amended, recites in pertinent part: "A semiconductor die stencil having at least a first surface and a second surface, *the first surface having a surface tension at least one order of magnitude greater than a surface tension of the second surface* to promote adhesive running onto a semiconductor die." (Emphasis added). Again, the Ahn reference and the HefeLe reference do not disclose this.

Claim 50, as amended, recites in pertinent part: " A semiconductor die stencil to assist in application of a printable adhesive material onto a substrate comprising...a coating applied to at least one surface of the sheet to promote spreading of the printable adhesive material, *wherein*

*the coating has a surface tension at least one order of magnitude less than the sheet.*". (Emphasis added). The Ahn reference and the Hefele reference do not disclose this. Claim 50 is therefore now allowable. Claims depending from claim 50 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claims 9-13, 41, 43 and 46-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,357,342 to Dreyfus (hereinafter, "the Dreyfus reference") in view of U.S. Patent No. 3,008,601 to Cahne (hereinafter, "the Cahne reference"). The Examiner has cited the Dreyfus reference for disclosing an apparatus suitable for steaming frozen foods, which includes a relatively thick sheet of a glass-ceramic substrate material having a plurality of tapered holes that extend through the substrate material. The Examiner admits, however, that the Dreyfus reference fails to disclose or suggest a polymer coating applied to a surface of the substrate disclosed in the Dreyfus reference. Accordingly, the Examiner has applied the Cahne reference that discloses a method for producing cooking utensils having a polytetrafluoroethylene (hereinafter, "PTFE") coating. Referring now in particular to the Cahne reference, the method for applying the PTFE coating to the article is shown in Figure 6, and described, at column 4, lines 73-75, bridging to column 5, lines 1-11. In pertinent part, Cahne teaches coating a substrate by attaching the substrate to a horizontal platen that is rotated while PTFE is applied to the rotating substrate from a centrally-disposed dispenser. The PTFE material is thereby *distributed over an entire surface* of the substrate.

Assuming, *arguendo*, that the Dreyfus reference and the Cahne reference are analogous art (see arguments regarding non-analogous art, presented below), Applicants respectfully submit that the cited combination fails to establish a *prima facie* case of obviousness. The Examiner is reminded that three requirements must be met in order to establish a *prima facie* rejection based upon obviousness:

"In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art...to combine the reference teachings. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.* The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art...”. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP §2142. (Emphasis added).

Applicants submit that the asserted combination fails to provide a *prima facie* case based upon, at least, a failure to provide the requisite motivation to combine the references, and further that the asserted combination fails to have the requisite reasonable expectation of success. Applicants first note that the Dreyfus reference is silent regarding the application of a PTFE coating (or *any* coating) to the disclosed substrate. With reference also in particular to the Cahne reference, Applicants submit that the coating procedure disclosed in the Cahne reference would substantially fill the holes provided in the substrate of Dreyfus. In fact, the Cahne reference describes one significant advantage present in the disclosed coating procedure at column 5, lines 50-55, which states, in pertinent part: “...cavities or pits 21<sup>a</sup> in the pan 21 which define cavities...receive extensions 20<sup>a</sup> of the polytetraflouroethylene layer 20, which extensions mate intimately with cavities 21<sup>a</sup> to hold the layer 20 to the frying pan 21.”. (Emphasis added). Accordingly, Applicants respectfully submit that the asserted combination fails to provide the requisite motivation because the Cahne reference teaches filling *all of the cavities* with the coating material. Ostensibly, the coating material would also form “extensions” that would fill holes within a perforated substrate. Accordingly, Applicants submit that Cahne *teaches away* from the presently disclosed embodiments, since the coating is intended to fill voids in the substrate. Further, Applicants submit that since the coating material of Cahne, which is spin-deposited onto the perforated substrate of Dreyfus, would substantially fill the holes of the substrate of Dreyfus, and would therefore yield an apparatus *that is entirely unsuited for the intended application*.

Finally, claims 46-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent No. 59-76868 (hereinafter, “the ‘868 reference”) in view of the Hefele reference. Applicants again disagree with the Examiner’s rejection, and request reconsideration of this rejection based upon the following remarks.

With reference to Figures 1 and 2 of the ‘868 reference, Applicants understand the reference to teach the application of a coating material 1 to a plate 2 having one or more apertures. Referring now in particular to Figure 2, which shows a partial cross sectional view of the plate 2, the coating 1 is seen to extend from a top surface of the plate 2 and into the apertures,

and onto a bottom surface of the plate 2. Based upon the translated abstract provided, the coating 1 may include a PTFE resin. The '868 reference therefore does not disclose or suggest selectively applying different coatings to the plate 2. As previously discussed, the Hefele reference does not remedy this shortcoming. Hefele also teaches applying a uniform diamond coating on a metallic plate. The Examiner is directed to column 2, lines 64-67, bridging to column 3, lines 1-3 for this teaching.

Returning once again to the claims, differences between the claim language and the applied art will be specifically pointed out. Claim 46 recites in pertinent part: "A semiconductor die stencil to assist in application of a printable adhesive in a desired pattern onto a semiconductor die comprising...a coating *selectively* applied to the bottom surface of the sheet..." (Emphasis added). The '868 reference and the Hefele reference, either singly or in combination, fail to disclose this. Instead, the '868 reference and the Hefele reference teach *uniformly* coating a mask structure with PTFE resin, or a diamond material, respectively.

Claim 46 is therefore now allowable. Claims depending from claim 46 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

#### Non-Analogous Art

Applicants respectfully submit that the Dreyfus reference and the Cahne reference are clearly non-analogous art which may not be used as a reference to reject Applicants claims on obviousness grounds. Accordingly, the Examiner is reminded that: "In order to rely on a reference as a basis for rejection of an applicant's invention, *the reference must either be in the field of Applicant's endeavor, or if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.*" (Emphasis added). *In re Oetiker* 177 F.2d 1493, 1446 (Fed. Cir. 1992). The Dreyfus reference, as well as the Cahne reference fail to satisfy these criteria. The Dreyfus and Cahne references are directed to the field of cooking utensils, and cookware, while the Applicants' disclosure is in the field of semiconductor device packaging, and more particularly, to the field of applying a patterned printable material onto a substrate, such as a semiconductor die.

The Dreyfus and the Cahne references are also not reasonably pertinent to Applicants' problem. "A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*. 966 F.2d 656, 659 (Fed. Cir. 1992). The matter with which the Dreyfus reference deals is directed to a frozen food cooker, which includes a relatively thick substrate of a glass-ceramic material (col. 2, line 16), which is not pertinent to applying a patterned material onto a substrate. In particular, Applicants note that the substrate has sufficient thickness to support the formation of a plurality of tapered holes (col. 2, lines 55-59), and may also be configured to have contoured sides to be accommodated within a cooking vessel (see generally, Figures 4 and 5). Accordingly, the Applicants maintain that the Dreyfus reference fails to be *reasonably pertinent* to the present application.

Similarly, the matter with which the Cahne reference deals is directed to coating cooking utensils with a polytetrafluoroethylene material. Significantly, the Cahne reference fails to disclose how a perforated supporting substrate may be coated with the disclosed material. Applicants therefore maintain that the Cahne reference also fails to be *reasonably pertinent* to the present application.

#### Double Patenting Rejection

Claims 9-12, 41 and 43 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 and 8-11 of co-pending Application No. 10/643,567. Claims 46-49 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 and 8-11 of co-pending Application No. 10/643,567 in view of Hefe.

Claims 9, 14, 40, 41, 44, 45 and 50-52 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of co-pending Application No. 10/701,140. Claims 9-14 and 40-52 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-46 of U.S. Patent No. 6,607,599.



Claims 9-14 and 40-52 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 6,641,669. Claims 9-14 and 40-52 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-77 of U.S. Patent No. 6,669,781. Claims 9-13 and 40-52 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 6,599,365.

Applicant does not admit that claims are obvious in view of any of the above cited references. Applicant will consider filing a Terminal Disclaimer when the claims are otherwise in condition for allowance and when the rejection in view of the application is no longer provisional.

*Reservation of Rights*

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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By



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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5 day of March 2007.

Name

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Signature

